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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,867	01/15/2002	Ewald Guenther	2001 P 08373 US	1665

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Siemens Corporation  
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Intellectual Property Department  
186 Wood Avenue South  
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EXAMINER

DOLAN, JENNIFER M

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 05/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/051,867

Applicant(s)

GUENTHER ET AL.

Examiner

Jennifer M. Dolan

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 February 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

*This action is in response to Amdt. A, filed 2/20/03*

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-5, 7, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,350 to Norman et al.

Regarding claims 1 and 25, Norman discloses a device comprising: a plurality of substrates (first substrate 311 and second substrate 322) mounted vertically in a stacked structure (figure 1); and active components (312, 316, and 319 on the first substrate, emitting blue light, and 313, 317, and 323 on the second substrate, emitting red light) arranged on each substrate, the active components of each substrate emitting light of a given wavelength through a stacked structure toward a viewing surface (figure 1), wherein the active components are arranged in an essentially non-overlapping pattern to allow non-overlapping vertical optical paths for the light emitted from the active components of different substrates (figure 1; column 2, lines 23-30).

Norman does, however, disclose a slight overlap between the active components on the first substrate and the active components on the second substrate, such that the active components are slightly overlapping (column 2, lines 60-66).

Art Unit: 2813

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the diode placement of Norman such that the active components are non-overlapping. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to provide a non-overlapping diode pattern in order to allow the red LEDs (313, 317, 323) to emit light unimpeded and unblocked by the intervening active components (see Norman, column 2, lines 60-63, lines 23-28). Since the overlap between the active components is only provided as a means of adjusting for minor misalignments between the two substrates, one skilled in the art would recognize that the device could be fabricated optionally lacking the overlap, without substantially changing the nature or operation of the device.

Regarding claim 3, Norman discloses that the substrate is glass or plastic (column 2, lines 8-10).

Regarding claim 24, Norman discloses that the active components of different substrates emit different wavelengths of light (column 2, lines 12-18; lines 50-54).

Regarding claim 4, Norman discloses that the active components emitting the shortest wavelength light (312, 316, 319) are placed closest to the viewing surface (figure 1).

Regarding claims 5 and 7, Norman discloses that the active components are distributed on a surface of each substrate (figure 1).

3. Claims 8-10 and 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norman et al. in view of U.S. Patent No. 6,329,085 to Burrows et al.

Art Unit: 2813

Regarding claim 8, Norman discloses that the active components on one of the substrates comprise one or more organic layers sandwiched between first and second conductive layers, forming an organic light emitting diode (column 2, lines 30-46).

Norman fails to disclose that the active components on the second substrate comprise organic layers sandwiched between first and second conductive layers.

Burrows discloses a red OLED using organic layers sandwiched between conductive layers (column 6, lines 14-24; column 15, lines 15 –63; column 16, lines 32-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the second substrate of Norman, such that it includes red OLEDs, rather than non-organic LEDs, as taught by Burrows. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to use a red OLED, because Norman suggests that at the time of the '350 patent, red organic LEDs did not produce red emissions having a wavelength of 650 nm, such that proper full color displays could not be achieved (Norman, column 1, lines 17-26). Burrows later teaches that red OLEDs having a wavelength of 650 nm (Burrows, figure 15) are possible, and lead to a more highly saturated red emission, as well as enhanced display brightness than had been previously possible (Burrows, column 6, lines 14-25). Thus, one skilled in the art would have substituted the OLED taught by Burrows into the display of Norman, in order to achieve the higher brightness and improved saturation.

Regarding claims 9 and 10, and 14-17, Norman as modified in claim 1, supra, discloses that the active components, which include the organic layers and first conductive layers, comprise a non-overlapping pattern, the pattern comprising strips (figures 1-3).

Art Unit: 2813

Regarding claims 12 and 13, Norman discloses that the conductive layer is magnesium-silver or lithium-silver (column 2, lines 44-46), both of which are opaque and comprise a metallic material.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Norman et al. in view of U.S. Patent Application Publication No. 2002/0135296 to Aziz et al.

Norman is silent as to the thickness of the substrate.

Aziz discloses a light-emitting device with a transparent substrate (paragraph 0071) having a thickness of 0.1 to 1 mm (paragraph 0072), which encompasses the range claimed in the present application.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify in Norman a substrate thickness of less than 0.5 mm. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to provide a substrate of less than 0.5 mm, because thicknesses in that range are considered suitable for light emitting device applications (Aziz, paragraph 0072), and the selection of a particular thickness is a matter of routine optimization of the substrate thickness based on the structural demands of the device (Aziz, paragraph 0072). Although neither Norman nor Aziz specify that the substrate must be less than 0.5 mm thick, it has been held that "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (1955).

Art Unit: 2813

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Norman et al. in view of Burrows et al. as applied to claim 5, supra, and further in view of U.S. Patent No. 5,739,552 to Kimura et al.

Regarding claim 6, Norman fails to disclose that the surface of each substrate is punctured and staggered.

Kimura discloses that the surface of each substrate (1, 10, 20) is punctured (figures 8a-8d) and staggered (figure 1e).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the substrates of Norman as modified by Burrows, such that they are punctured and staggered, as taught by Kimura. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to provide substrates with staggered surfaces, in order to allow for the placement of contact electrodes for the lower LEDs (Kimura, figure 1e). A person having ordinary skill would further have been motivated to puncture the surface of each substrate, in order to decrease the total height of the device (Kimura, figure 8d) by allowing the LED layers to be stacked in and under the plane of the substrate, rather than on top of the substrate, and to allow the device electrodes to be in the same plane as the device, thus decreasing the need for complicated processing (Kimura, column 14, lines 52 – 67).

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Norman et al. in view of Burrows et al, as applied to claim 8, above, and further in view of Aziz et al.

Norman is silent as to the thickness of the first and second conductive layers.

Art Unit: 2813

Aziz discloses thicknesses of the first (12,22,32, and 42) conductive layer of 0.001-5 microns, with a preferred range of 0.03 – 0.3 microns (paragraph 0075); and thicknesses of the second (18, 28, 38, and 48) conductive layer of 0.01 – 0.5 nm (paragraph 0099), which intersect the ranges claimed in the present application.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that the conductive layers of Norman as modified by Burrows, have thicknesses of about 0.02 – 1 micron, as taught by Aziz. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to specify thicknesses of about 0.02-1 micron, because such thicknesses are suitable and preferred for light emitting device structures similar to that of Norman and of the present application (Aziz, paragraphs 0075 and 0099). Although the exact range of 0.02-1.0 microns was not disclosed by Norman or Aziz, it has been held that “where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (1955).

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Norman et al. in view of U.S. Patent No. 6,211,538 to Park.

Norman fails to disclose that the active components are distributed on a first surface and a second surface of each substrate.

Park discloses that the active components (430 and 450) are distributed on a first surface and a second surface of the substrate (410; figure 4).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device structure of Norman such that active components are distributed on first and second surfaces of the substrate, as taught by Park. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to distribute active components on both sides of the substrate, in order to further separate the light emitting elements, so that the electrodes don't short each other and so that the light paths don't interfere. Additionally, it's advantageous to dispose the layered structures for each light emitting element on a planar substrate surface than it is to deposit one element on top of the other element, because layer deposition or growth on top of an uneven or already processed layer tends to lead to defects in crystallinity and growth, as is appreciated by one skilled in the art. Because Park shows that structures wherein active components are distributed solely on one side of a substrate (Park, figures 1 and 2), and structures wherein active components are distributed on two surfaces of a substrate (Park, figures 3 and 4) are essentially equivalent and can be used interchangeably, it is well within the purview of a person having ordinary skill in the art to select an arrangement with active components distributed on both surfaces of the substrate for the advantages listed supra.

8. Claims 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norman et al. in view of Park, as applied to claim 18, supra, and further in view of Burrows et al.

Regarding claim 19, Norman discloses that the active components on one of the substrates comprise one or more organic layers sandwiched between first and second conductive layers, forming an organic light emitting diode (column 2, lines 30-46).

Norman fails to disclose that the active components on the second substrate comprise organic layers sandwiched between first and second conductive layers.

Burrows discloses a red OLED using organic layers sandwiched between conductive layers (column 6, lines 14-24; column 15, lines 15 –63; column 16, lines 32-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the second substrate of Norman as modified by Park, such that it includes red OLEDs, rather than non-organic LEDs, as taught by Burrows. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to use a red OLED, because Norman suggests that at the time of the '350 patent, red organic LEDs did not produce red emissions having a wavelength of 650 nm, such that proper full color displays could not be achieved (Norman, column 1, lines 17-26). Burrows later teaches that red OLEDs having a wavelength of 650 nm (Burrows, figure 15) are possible, and lead to a more highly saturated red emission, as well as enhanced display brightness than had been previously possible (Burrows, column 6, lines 14-25). Thus, one skilled in the art would have substituted the OLED taught by Burrows into the display of Norman, in order to achieve the higher brightness and improved saturation.

Regarding claims 20, 22, and 23, Norman as modified in claim 19, supra, discloses that the active components, which include the organic layers and first conductive layers, comprise a non-overlapping pattern (figures 1-3).

Regarding claim 21, Norman discloses that the conductive layer is magnesium-silver or lithium-silver (column 2, lines 44-46), both of which are opaque.

*Response to Arguments*

9. Applicant's arguments with respect to claims 1-25 have been considered but are moot in view of the new grounds of rejection.

Examiner's note: The amendment to claim 1, requiring general light-emitting active components which are provided entirely in a non-overlapping manner, rather than only requiring specified organic layers or first electrodes provided in a non-overlapping manner (as in claims 8 and 20), necessitated the new grounds of rejection.

*Conclusion*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 2813

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (703) 305-3233.

The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (703) 308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Jennifer M. Dolan  
Examiner  
Art Unit 2813

jmd  
May 22, 2003

  
CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800